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With the rapid expansion of university science departments and leveling off of federal academic research support, there is concern that young faculty are unable to perform as much research as would be desirable. To determine the distribution of research activity and support between young and senior staff, the National Science Foundation conducted a survey which elicited data and opinions from 871 science and engineering department heads. Preceded by exploratory interviews, the survey dealt with overall faculty composition, time spent on research, and funding patterns. It was found that: 4 out of 10 faculty were awarded PhDs within the past 7 years; of the recent PhDs, 9 out of 10 were engaged in research at least 20% of the time; of older PhDs, 8 out of 10 were. Little correlation appeared between the proportion of young faculty in selected fields and the source of the department's research funds; 57% of young faculty and 70% of senior faculty were in federally connected research. Over two-thirds of the respondents said the division of available funds between young and senior staff was appropriate. Little relationship appears between the proportion of respondents indicating the distribution of funds was inadequate for young staff and the amount of federal science support awarded their institutions. Insufficient performance of research by young staff was related to fund limitations and allocation mechanisms. Some respondents felt that young staff should be granted a greater choice of research topics and be awarded specific support programs. (JS)

ED027830

Support and Research Participation of Young and Senior Academic Staff, 1968

National Science Foundation
NSF 68-31

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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FOREWORD

With the rapid expansion of university science departments and the recent leveling off of Federal academic research support there has been growing concern that young university faculty are not able to carry out as much research as would seem desirable. It is, of course, almost impossible to determine the optimum research involvement of either young or senior academic faculty members. However, within the framework of existing research budgets, it is important to ascertain for policy determination whether young faculty are experiencing more difficulty in obtaining research support than their senior colleagues. Almost no quantitative information has been available to provide insight into this particular problem. Consequently, the National Science Foundation initiated a survey in mid-1968 to collect data and opinions from heads of departments in selected fields of science and engineering.

The survey questions dealt with the overall composition of faculty, the fraction of time spent on research, and the funding patterns related to research. In all cases information was requested for both young and senior investigators. It was fully recognized that the views of others not covered by the survey may in some instances differ from those reported. However, department heads generally reflect broad views based on concern for the overall welfare of departments and the various fields of science.

The remarkable completeness and timeliness of the response are indicative of the importance of the problem, and the Foundation appreciates deeply the cooperation of the department heads who participated in the survey. While, as expected, no clear consensus was obtained on some questions, definite trends of opinion were evident with regard to other very basic issues. It is expected that the summary of these opinions and the factual data developed by the survey will provide an important basis for future Federal and non-Federal science policy formulation.

Charles E. Falk
Planning Director
National Science Foundation

October 1968

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The survey was conducted and this report prepared in the Office of Economic and Manpower Studies, H. E. Riley, Head, within the National Science Foundation's Planning Organization. The work was performed in the Sponsored Surveys and Studies Section, Thomas J. Mills, Head, by the Science Education Studies Group, Justin C. Lewis, Study Director, and Felix H. I. Lindsay, Associate Study Director. Sidney Jaffe assisted in the development of the survey instrument; Bernard Stein, of the Office of Planning and Policy Studies, carried out preliminary interviews and participated in the planning and conduct of the survey.

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PURPOSE AND METHODOLOGY

The primary purpose of this study was to obtain information from department heads in institutions of higher education on the relative distributions of research activity and support between "young" and "senior" staff. Prior to the extensive mail survey, which is the basis of this report, exploratory interviews were held with the heads of departments at a number of universities. These interviews indicated both the need and feasibility for a systematic collection of quantitative data to determine the extent of research participation problems. These interviews were also very helpful in the formulation of the concepts used in the survey. The mail survey questionnaire was tested at several departments prior to the conduct of the actual survey, and a number of changes were made in the questionnaire on the basis of the pretest findings.

In the formal survey, a large number of departments were surveyed with respect to information on faculty composition, activity, and research support. For this purpose, an arbitrary distinction was made between "young" and "senior" staff. Faculty members who had received their Ph.D.'s after 1960 (7 years or less in spring 1968) were considered to be in the "young" category; those who spent 20 percent or more of their time in research were designated "young investigators."

Department heads were asked to indicate their opinions on the adequacy of research participation, split of research support between young and senior investigators, factors associated with support problems, and means of alleviating problems. Information was requested for senior investigators and young investigators for comparative purposes, and a limited amount of information on related variables was obtained. In all, 10 questions--some with several parts--were asked. (See appendix for survey schedule and accompanying letter.) Space for supplemental comments was provided on the questionnaire, and many department heads took advantage of this opportunity to provide further helpful information.

The survey population included department heads in 13 selected science and engineering fields, which together account for about two-thirds of all science doctorates awarded. The mailing list of departments was selected principally from applications for 1968 National Science Foundation traineeships but was limited to departments awarding at least one Ph.D. in 1966-67. The basic list was supplemented with a few additional departments, primarily in the life sciences, suggested by the National Institutes of Health. The survey covered 871 departments located in 171 of the approximately 200 American institutions granting Ph.D.'s in science or engineering.

Nine out of 10 departments surveyed responded to the May 1968 questionnaire. Some responses were received too late for the tabulation deadline. Consequently, the analysis presented in this report is based on data provided by 738 departments in 167 institutions. They accounted for about 75 percent of the Ph.D.'s granted in the selected fields.

In the process of reviewing the returned questionnaires, it became evident that question number 7 (relating to choice of subjects of research) may not have been uniformly interpreted by all respondents. To clarify this point, telephone calls were made to a stratified subsample of 117 department heads chosen among the 378 who had previously reported the existence of a problem in question number 7. Each head was asked for an opinion to a structured two-part question in an attempt to elicit separate responses to problems related to the total amount of research as distinct from problems related to choice of research topics. The structured question and introductory statement are reproduced in the appendix. The information obtained as a result of the telephone calls is summarized in table 11.

This report is based primarily on the information collected through the survey questionnaire. The only exogenous data are those related to total Federal support for academic science to the parent institutions. The latter are not available for individual departments.

SUMMARY OF FINDINGS

- Four out of 10 of the faculty in the surveyed departments had been awarded Ph.D.'s within the past 7 years.

Faculty	Total number	Years since Ph.D.				Had no Ph.D.	
		7 years or less		More than 7 years			
		Number	Percent	Number	Percent	Number	Percent
Total faculty..	16,578	6,473	39	8,886	54	1,219	7
Spending 20 percent or more time on research.....	13,631	5,850	43	7,379	54	402	3
Spending 20 percent or more time on research connected with Federal research projects...	8,655	3,327	38	5,171	60	157	2

- Of these recent Ph.D.'s, nine out of 10 were engaged in research at least 20 percent of the time (i.e., young investigators); of older Ph.D.'s, eight out of 10 were (i.e., senior investigators). Over two-thirds of the reporting departments indicated that all of their young faculty were engaged in research 20 percent or more of their time.

- There appeared to be little correlation between the proportion of young faculty in selected fields of research and the source of the department's research funds. Thus, control of allocation of funds, whether exercised by Government agencies or university administrators, does not appear to be a significant factor.

- Fifty-seven percent of young investigators and 70 percent of senior investigators were in research connected with Federal project grants or contracts.

- Over two-thirds of the respondents indicated that they thought the division of available research funds between young and senior staff was appropriate. Among the one-third who believed that it was not appropriate, five out of six thought the young staff was not doing an adequate amount of research.

Departments	Number of departments	Percent
All departments	738	100
Departments indicating appropriate split of funds	504	68
Departments indicating inappropriate split:	228	31
Inadequate amount of research being performed by:		
Young investigators	184	25
Senior investigators	44	6
Departments not specifying	6	1

- There does not appear to be a close relationship between the proportion of department heads indicating that the distribution of funds was not adequate for young investigators and the amount of Federal support for academic science awarded to their parent institutions. The amount of Federal support is to some extent an indicator of the size of an institution.

- The reasons given most often for young investigators not performing an adequate amount of research were related to total fund limitations and the mechanisms for allocating funds.

Reasons given by department heads (more than one reason was given by some)	Percent of department heads
Fund limitations	51
Mechanisms discriminate against young investigators	48
Insufficient space or equipment	13
Insufficient time for research	12
Lack of graduate students	9

- Almost one-fourth of the department heads in six selected fields felt that investigators (young and senior) were not able to select research areas of their own choosing to the extent that the department heads thought they should. The problem was reported as applying to young investigators twice as often as to senior investigators. Department heads citing the problem of choice of research subjects generally classified it as a "minor" problem.

- Eighty-five percent of the 184 department heads who indicated that an adequate amount of research was not being done by young investigators recommended that specific support programs for them be instituted, and almost two-thirds thought that special equipment should be earmarked for the young group. The number favoring increased emphasis on institutional, departmental, or block grants (53 percent) exceeded only slightly those desiring expansion of research project support (45 percent). The recommendations for changes in research support programs, on the assumption that the amount of research funds available from various sources would not increase, were as follows:

	Percent
Provide specific support programs for young investigators.....	85
Provide special equipment earmarked for the young group.....	61
Allocate a greater portion of currently available Federal funds to institutional, departmental, or block grants	53
Allocate a greater portion of currently available funds to research project *grants or contracts*.....	45
Provide specific support for the senior investigators.....	15
Make no changes in Federal research support programs.....	1

F I N D I N G S

NOTES

The annotations at the head of the following tables are intended to highlight some of the principal findings. Other findings are apparent from an examination of the data in the tables. Highlights do not include reference to table items where the response was from fewer than 10 department heads.

An arbitrary distinction is made between "young" and "senior" staff--faculty members who had received their Ph.D.'s after 1960 (7 years or less in spring 1968) were considered to be in the "young" category; those who spent 20 percent or more of their time in research were designated "young investigators."

Data presented for the aggregate field of "life sciences" are simply the summation of the selected life science fields. The summation facilitates reference and accommodates the small number of departments represented in some life science fields in certain tables.

The surveyed departments are classified by field in accordance with the departmental titles shown in the National Science Foundation graduate traineeship applications.

TABLE 1. SURVEY POPULATION AND RESPONSE

Field	Number of departments surveyed	Number of usable replies	Percent of usable replies
All fields	871	738	84.7
Physics	110	90	81.8
Chemistry	146	131	89.7
Mathematics	92	81	88.0
Electrical engineering .	78	70	89.7
Chemical engineering ...	64	59	92.2
Life sciences	169	140	82.8
Biochemistry	45	39	86.7
Biosciences	12	9	75.0
Biology	50	38	76.0
Microbiology	32	30	93.8
Physiology	30	24	80.0
Sociology	44	38	86.4
Economics	71	55	77.5
Psychology	97	74	76.3

TABLE 2. COMPOSITION OF FACULTY, BY YEARS SINCE PH.D.

- Four out of 10 of the faculty in the surveyed departments had held their Ph.D.'s for 7 years or less.
- The highest proportion of faculty in the "7 years or less" category (almost half) was reported by mathematics departments.
- The smallest proportion of total faculty who had held their Ph.D.'s for 7 years or less was reported in the life sciences--from one-fourth to one-third.

Field	Total number of faculty	Years since Ph.D.				Had no Ph.D.	
		7 years or less		More than 7 years			
		Number	Percent	Number	Percent	Number	Percent
All fields.....	16,578	6,473	39.0	8,886	53.6	1,219	7.4
Physics.....	2,398	919	38.3	1,399	58.3	80	3.3
Chemistry.....	2,849	967	33.9	1,797	63.1	85	3.0
Mathematics.....	2,993	1,406	47.0	1,302	43.5	285	9.5
Electrical engineering	1,738	727	41.8	662	38.1	349	20.1
Chemical engineering	684	249	36.4	378	55.3	57	8.3
Life sciences.....	2,232	692	31.0	1,418	63.5	122	5.5
Biochemistry.....	584	176	30.1	383	65.6	25	4.3
Biosciences.....	229	61	26.6	157	68.6	11	4.8
Biology.....	748	251	33.6	458	61.2	39	5.2
Microbiology.....	353	105	29.7	232	65.7	16	4.5
Physiology.....	318	99	31.1	188	59.1	31	9.7
Sociology.....	714	296	41.5	343	48.0	75	10.5
Economics.....	1,295	496	38.3	665	51.4	134	10.3
Psychology.....	1,675	721	43.0	922	55.0	32	1.9

TABLE 3. PROPORTION OF FACULTY SPENDING 20 PERCENT OR MORE OF THEIR TIME IN RESEARCH

- Nine out of 10 of the recent Ph.D.'s and eight out of 10 of the older Ph.D.'s spent at least 20 percent of their time on research. Field by field, younger faculty consistently were engaged in research in greater proportions than their older colleagues.
- More than 95 percent of recent Ph.D.'s in physics, chemistry, biochemistry, microbiology, and physiology departments spent more than 20 percent of their time in research.
- Over 90 percent of the older Ph.D.'s in biochemistry, microbiology, and physiology spent 20 percent or more of their time in research.

Field	Percent spending 20 percent or more time in research			
	All faculty	Years since Ph.D.		Had no Ph.D.
		7 years or less	More than 7 years	
All fields.....	82.2	90.4	83.0	33.0
Physics.....	90.2	97.9	89.2	17.5
Chemistry.....	85.4	95.7	83.0	18.8
Mathematics.....	80.1	93.1	80.9	11.9
Electrical engineering	69.2	80.7	77.3	29.5
Chemical engineering.	77.2	82.3	79.9	36.8
Life sciences.....	89.2	93.1	89.8	60.7
Biochemistry.....	97.8	98.9	97.4	96.0
Biosciences.....	78.6	83.6	78.3	54.5
Biology.....	83.0	88.4	84.9	25.6
Microbiology.....	92.1	97.1	92.2	56.3
Physiology.....	92.5	96.0	92.6	80.6
Sociology.....	75.9	79.1	77.3	57.3
Economics.....	81.1	87.5	79.5	64.9
Psychology.....	79.3	84.9	76.6	31.3

Note: See tables 4 and 5 for related data.

TABLE 4. COMPOSITION OF FACULTY SPENDING 20 PERCENT OR MORE OF THEIR TIME IN RESEARCH

- Among faculty spending 20 percent or more time in research, two-fifths were young investigators (i.e., 7 years or less since their Ph.D.'s).
- The highest proportion was reported in mathematics, where the young investigators amounted to over one-half of those spending 20 percent or more time in research.
- The lowest proportion was reported in the life sciences, where the young investigators constituted about one-third of those spending 20 percent or more time in research.

Field	Total faculty spending 20 percent or more time in research	Years since Ph.D.				Had no Ph.D.	
		7 years or less		More than 7 years			
		Number	Percent	Number	Percent	Number	Percent
All fields	13,631	5,850	42.9	7,379	54.1	402	2.9
Physics	2,162	900	41.6	1,248	57.7	14	.6
Chemistry	2,432	925	38.0	1,491	61.3	16	.7
Mathematics	2,396	1,309	54.6	1,053	43.9	34	1.4
Electrical engineering ..	1,202	587	48.8	512	42.6	103	8.6
Chemical engineering	528	205	38.8	302	57.2	21	4.0
Life sciences	1,991	644	32.3	1,273	64.0	74	3.7
Biochemistry	571	174	30.5	373	65.3	24	4.2
Biosciences	180	51	28.3	123	68.3	6	3.3
Biology	621	222	35.7	389	62.6	10	1.6
Microbiology	325	102	31.4	214	65.8	9	2.8
Physiology	394	95	32.3	174	59.2	25	8.5
Sociology	542	234	43.2	265	48.9	43	7.9
Economics	1,050	434	41.3	529	50.4	87	8.3
Psychology	1,328	612	46.1	706	53.2	10	.8

TABLE 5. PROPORTION OF YOUNG FACULTY SPENDING 20 PERCENT OR MORE OF THEIR TIME IN RESEARCH, BY FIELD

- Over two-thirds (69.1 percent) of the reporting departments indicated that all of their young faculty were engaged in research 20 percent or more of their time. Another 15.2 percent stated that between 75 percent and 100 percent of their faculty were engaged in research 20 percent or more of their time.

Field, and proportion of departments' young faculty in research 20 percent or more of their time	Number of departments[a/]	Percent
All fields	732	100.0
Less than 50 percent	40	5.5
50 to 75 percent	75	10.2
75 to 100 percent	111	15.2
100 percent	506	69.1
Physics	90	100.0
Less than 50 percent	0	--
50 to 75 percent	4	4.4
75 to 100 percent	8	8.9
100 percent	78	86.7
Chemistry	131	100.0
Less than 50 percent	2	1.5
50 to 75 percent	6	4.6
75 to 100 percent	15	11.5
100 percent	108	82.4
Mathematics	81	100.0
Less than 50 percent	0	--
50 to 75 percent	9	11.1
75 to 100 percent	27	33.3
100 percent	45	55.6
Electrical engineering	70	100.0
Less than 50 percent	9	12.9
50 to 75 percent	16	22.9
75 to 100 percent	14	20.0
100 percent	31	44.3

See footnote at end of table.

TABLE 5. PROPORTION OF YOUNG FACULTY SPENDING 20 PERCENT OR MORE OF THEIR TIME IN RESEARCH, BY FIELD (Continued)

Field, and proportion of departments' young faculty in research 20 percent or more of their time	Number of departments[a/]	Percent
Chemical engineering	57	100.0
Less than 50 percent	7	12.3
50 to 75 percent	5	8.8
75 to 100 percent	5	8.8
100 percent	40	70.2
Life sciences	137	100.0
Less than 50 percent	3	2.2
50 to 75 percent	9	6.6
75 to 100 percent	10	7.3
100 percent	115	83.9
Sociology	37	100.0
Less than 50 percent	6	16.2
50 to 75 percent	6	16.2
75 to 100 percent	9	24.3
100 percent	16	43.2
Economics	55	100.0
Less than 50 percent	8	14.5
50 to 75 percent	6	10.9
75 to 100 percent	9	16.4
100 percent	32	58.2
Psychology	74	100.0
Less than 50 percent	5	6.8
50 to 75 percent	14	18.9
75 to 100 percent	14	18.9
100 percent	41	55.4

a/ Excludes six departments with no young investigators.

TABLE 6. PROPORTION OF INVESTIGATORS WHO ARE CONNECTED WITH FEDERAL PROJECT GRANTS AND CONTRACTS

- Two-thirds of all faculty in research (i.e., 20 percent or more of their time) were doing research connected with Federal project grants and contracts.
- Fields in which the highest proportion of faculty in research were funded by Federal project awards were the life sciences, physics, and electrical engineering. Economics and sociology department heads reported the lowest proportion of researchers on Federal project grants or contracts.
- In most fields, fewer young investigators than senior investigators participated in Federal projects. Chemical engineering and economics were the only fields in which the young investigators participated on equal terms.

Field	Percent connected with Federal projects				
	All investigators	Years since Ph.D.			Had no Ph.D.
		7 years or less (young)	More than 7 years (senior)	Ratio (senior ÷ young)	
All fields	63.5	56.9	70.1	1.2	39.1
Physics	77.1	72.3	80.6	1.1	71.4
Chemistry	64.1	52.3	71.9	1.4	25.0
Mathematics	58.0	51.1	67.3	1.3	32.4
Electrical engineering ..	73.0	71.6	80.5	1.1	44.7
Chemical engineering	62.1	62.9	63.2	1.0	38.1
Life sciences	80.6	73.1	84.4	1.2	78.4
Biochemistry	89.7	84.5	92.0	1.1	91.7
Biosciences	70.0	51.0	79.7	1.6	33.3
Biology	70.7	62.6	76.6	1.2	20.0
Microbiology	85.2	80.4	87.4	1.1	88.9
Physiology	85.0	81.1	85.6	1.1	96.0
Sociology	37.5	30.8	46.4	1.5	18.6
Economics	23.4	24.9	24.4	1.0	10.3
Psychology	58.7	52.8	64.3	1.2	30.0

Note: See table 7 for related data.

TABLE 7. COMPOSITION OF FACULTY SPENDING AT LEAST 20 PERCENT OF THEIR TIME IN RESEARCH CONNECTED WITH FEDERAL PROJECT GRANTS AND CONTRACTS

- Almost two-fifths of those engaged in research on Federal project grants or contracts for 20 percent or more of their time were young investigators. This is the same proportion as young faculty were in total faculty (see table 2).

- The highest proportions of young investigators in Federal research project grants and contracts were reported in mathematics and electrical engineering. The life science departments reported the smallest proportions of young investigators in Federal projects.

Field	Total faculty spending 20 percent or more time on Federal research projects	Years since Ph.D.				Had no Ph.D.	
		7 years or less		More than 7 years			
		Number	Percent	Number	Percent	Number	Percent
All fields	8,655	3,327	38.4	5,171	59.7	157	1.8
Physics	1,667	651	39.1	1,006	60.3	10	.6
Chemistry	1,560	484	31.0	1,072	68.7	4	.3
Mathematics	1,389	669	48.2	709	51.0	11	.8
Electrical engineering .	878	420	47.8	412	46.9	46	5.2
Chemical engineering ...	328	129	39.3	191	58.2	8	2.4
Life sciences	1,604	471	29.4	1,075	67.0	58	3.6
Biochemistry	512	147	28.7	343	67.0	22	4.3
Biosciences	126	26	20.6	98	77.8	2	1.6
Biology	439	139	31.7	298	67.9	2	.5
Microbiology	277	82	29.6	187	67.5	8	2.9
Physiology	250	77	30.8	149	59.6	24	9.6
Sociology	203	72	35.5	123	60.6	8	3.9
Economics	246	108	43.9	129	52.4	9	3.7
Psychology	780	323	41.4	454	58.2	3	.4

TABLE 8. APPROPRIATENESS OF THE DIVISION OF RESEARCH FUNDS BETWEEN YOUNG AND SENIOR FACULTY

- Over two-thirds of department heads indicated that the division of research funds between young and senior staff was appropriate.
- Departments most often citing the distribution as <u>not</u> appropriate included chemistry, sociology, and electrical engineering.
- A great majority of those who stated that the distribution was not appropriate felt that an inadequate amount of research was being performed by the young investigators.

Field	All departments	Percent of departments indicating--			
		Split appropriate	Split not appropriate, inadequate amount of research being performed by--		Percent not specified
			Young	Senior	
All fields	738	68.3	24.9	6.0	0.8
Physics	90	66.7	28.9	3.3	1.1
Chemistry	131	55.0	34.4	8.4	2.3
Mathematics	81	70.4	24.7	2.5	2.5
Electrical engineering ...	70	62.9	25.7	11.4	.0
Chemical engineering	59	74.6	18.6	6.8	.0
Life sciences	140	72.9	20.0	7.1	.0
Biochemistry	39	69.2	30.8	.0	.0
Biosciences	9	55.6	22.2	22.2	.0
Biology	38	78.9	13.2	7.9	.0
Microbiology	30	73.3	16.7	10.0	.0
Physiology	24	75.0	16.7	8.3	.0
Sociology	38	60.5	31.6	7.9	.0
Economics	55	72.7	21.8	5.5	.0
Psychology	74	83.8	16.2	.0	.0

TABLE 9. REPLIES INDICATING INADEQUATE PROPORTIONS OF RESEARCH FUNDS FOR YOUNG INVESTIGATORS, GROUPED BY AMOUNT OF FEDERAL ACADEMIC SCIENCE FUNDS AWARDED TO THE PARENT INSTITUTIONS

- There appears to be no consistent relationship between (a) the percent of department heads indicating inadequate proportions of the amounts of research funds available and research performed by young investigators and (b) the amounts of Federal funds for science obligated to the parent institutions in FY 1966. (Read table as follows: 22.2 percent of department heads in institutions receiving $30 million or more from the Federal Government thought young investigators were not getting an adequate portion of available research funds.)

Field	Percent of departments indicating inadequate proportions for young investigators					
	All departments	Departments, by parent institution's Federal funds for academic science, FY 1966				
		$30 million or more	$20 to $30 million	$10 to $20 million	$1 to $10 million	Less than $1 million
All fields.....	24.9	22.2	28.0	23.8	28.5	8.1
Physics.....	28.9	23.1	28.6 a/	22.7	34.8	.0 a/
Chemistry.....	34.4	37.5	45.5	32.1	34.9	23.1
Mathematics.....	24.7	13.3	.0 a/	33.3	32.1	.0 a/
Electrical engineering	25.7	28.6	25.0 a/	28.6	24.0	.0 a/
Chemical engineering.	18.6	21.4	12.5 a/	11.8	31.3	.0 a/
Life sciences.....	20.0	17.4	31.6	20.5	20.0	.0 a/
Biochemistry.....	30.8	27.3	60.0 a/	15.4	44.4 a/	.0 a/
Biosciences.....	22.2 a/	100.0 a/	.0 a/	.0 a/	20.0 a/	.0 a/
Biology.....	13.2	.0 a/	25.0 a/	33.3 a/	5.3	.0 a/
Microbiology.....	16.7	12.5 a/	20.0 a/	14.3	33.3 a/	--
Physiology.....	16.7	.0 a/	25.0 a/	28.6 a/	25.0 a/	.0 a/
Sociology.....	31.6	33.3 a/	33.3 a/	18.8	57.1 a/	--
Economics.....	21.8	20.0	33.3 a/	22.2	21.4	.0 a/
Pyschology.....	16.2	10.0	37.5 a/	19.0	12.9	.0 a/

a/ Based on less than 10 departments; with 0.0 percent, indicates none reported the problem.
Note: Federal funds for academic science include funds for research and development, R&D plant, scholarships, fellowships, traineeships, institutes, equipment, etc.

TABLE 10. REASONS GIVEN FOR YOUNG INVESTIGATORS NOT PERFORMING AN ADEQUATE AMOUNT OF RESEARCH

- The two reasons given most often for young investigators not performing an adequate amount of research were related to total fund limitations and the mechanisms for allocating funds.
- In mathematics and economics "insufficient time for research" was a principal reason given.

Field	Departments indicating young investigators performing an inadequate amount of research	Percent of department heads giving designated reason				
		Fund limitations	Mechanisms discriminate against young investigators	Insufficient space or equipment	Insufficient time for research	Lack of graduate students
All fields..	184	50.5	47.8	13.0	12.0	9.2
Physics.....	26	76.9	38.5	7.7	7.7	3.8
Chemistry.....	45	57.8	53.3	33.3	6.7	24.4
Mathematics.....	20	25.0	25.0	.0	45.0	5.0
Electrical engineering.....	18	61.1	50.0	11.1	.0	.0
Chemical engineering	11	18.2	81.8	.0	18.2	18.2
Life sciences....	28	46.4	50.0	10.7	3.6	3.6
Biochemistry...	12	58.3	8.3	25.0	.0	.0
Biosciences....	2	50.0	50.0	.0	.0	.0
Biology.....	5	20.0	80.0	.0	.0	.0
Microbiology...	5	40.0	100.0	.0	20.0	20.0
Physiology.....	4	50.0	75.0	.0	.0	.0
Sociology.....	12	41.7	58.3	.0	8.3	8.3
Economics.....	12	25.0	50.0	.0	33.3	.0
Psychology.....	12	66.7	33.3	16.7	.0	.0

Note: Percent details may add to more than 100 because some chairmen gave more than one reason.

TABLE 11. ABILITY OF STAFF IN SELECTED FIELDS TO SELECT RESEARCH AREAS OF THEIR OWN CHOOSING TO THE EXTENT THEY SHOULD

- Slightly less than one-fourth of all department heads in the selected fields felt that investigators (young and senior) were not able to select research areas of their own choosing to the extent that the department heads thought they should. The problem was reported almost twice as often for the young staff as for the senior staff.

- Problems in the choice of research areas were reported most frequently in the sociology and electrical engineering fields and with equal applicability to both the young and senior staff.

Selected fields	Number of departments	Estimated percent of department heads a/ indicating research area was--			
		No problem	A problem for--		
			Young and/or senior staff b/	Young staff	Senior staff
All selected fields.....	609	76.4	23.6	21.5	12.4
Physics.....	90	82.3	17.7	17.7	5.9
Chemistry.....	131	75.3	24.7	21.6	12.4
Mathematics.....	81	98.2	1.8	.0	1.8
Electrical engineering	70	52.0	48.0	36.0	36.0
Chemical engineering.	59	67.9	32.1	32.1	16.1
Life sciences.....	140	81.4	18.6	18.6	2.1
Sociology.....	38	59.0	41.0	41.0	41.0

a/ Based in part on sample of departments shown in column 1.
b/ These percentages, as totals of departments with the problem, are less than the sums of the percentages for young staff and senior staff because some department heads (10.3 percent) reported the problem for both young and senior staff.

TABLE 12. RECOMMENDATIONS MADE BY DEPARTMENT HEADS WHO INDICATED THAT AN INADEQUATE AMOUNT OF RESEARCH WAS BEING PERFORMED BY YOUNG INVESTIGATORS

- Of the department heads who indicated that an adequate amount of research was not being done by young investigators, 85 percent recommended that specific support programs for them be instituted. Also, 61 percent of the total thought that special equipment should be earmarked for the young group. Recommendations assumed that the amount of research funds from various sources would not increase.

- Among those who indicated that a young investigator problem existed, the total favoring increased emphasis on institutional, departmental, or block grants exceeded only slightly those desiring expansion of the research project grant mechanism.

Field	Departments indicating young investigators performing inadequate amount of research	Percent of department heads a/ recommending--					
		A	B	C	D	E	F
All fields.....	184	85.3	61.4	52.7	44.6	14.7	0.5
Physics.....	26	84.6	73.1	53.8	42.3	11.5	.0
Chemistry.....	45	86.7	73.3	46.7	46.7	11.1	2.2
Mathematics.....	20	80.0	15.0	55.0	55.0	10.0	.0
Electrical engineering	18	72.2	66.7	61.1	50.0	22.2	.0
Chemical engineering..	11	81.8	54.5	54.5	36.4	18.2	.0
Life sciences.....	28	89.3	85.7	35.7	53.6	25.0	.0
Biochemistry.....	12	83.3	75.0	16.7	50.0	25.0	.0
Biosciences.....	2	100.0	100.0	50.0	50.0	.0	.0
Biology.....	5	80.0	80.0	60.0	60.0	.0	.0
Microbiology.....	5	100.0	100.0	60.0	40.0	40.0	.0
Physiology.....	4	100.0	100.0	25.0	75.0	50.0	.0
Sociology.....	12	100.0	41.7	50.0	41.7	16.7	.0
Economics.....	12	83.3	.0	91.7	8.3	.0	.0
Psychology.....	12	91.7	91.7	58.3	41.7	16.7	.0

a/ Most respondents made several recommendations:

A - Provide specific support programs for young investigators.

B - Provide special equipment earmarked for the young group.

C - Allocate a greater portion of currently available Federal funds to institutional, departmental, or block grants.

D - Allocate a greater portion of currently available funds to research project grants or contracts.

E - Provide specific support for staff in the senior group.

F - Make no changes in Federal research support programs.

APPENDIX

SURVEY QUESTIONNAIRE AND TELEPHONE FOLLOW-UP

NATIONAL SCIENCE FOUNDATION

WASHINGTON, D.C. 20550

May 3, 1968

Dear Departmental Chairman:

The enclosed questionnaire is being sent to you and to other heads of selected departments in a limited number of institutions. We are seeking additional insight into research activity in institutions of higher education. Hopefully, this will enable us to make recommendations for the improvement of National Science Foundation practices and national science policies. Since the number of individuals queried is not large, it is quite important that your answers be included along with others in your field. Your helpfulness in assisting us in this endeavor by completing the questionnaire promptly will be appreciated. In the summarization of this study the information obtained from individual departments or institutions will not be identified in published material.

If there are any questions concerning the information requested, please write to the Planning Director, National Science Foundation, 1800 G Street, N.W., Washington, D.C. 20550, or call the Science Education Studies Group:

Study Director	Area Code 202,	343-7822
Associate Study Director	"	343-6516

Please submit your response on the copy of the questionnaire labeled with the name of your department and institution. Replies should be sent to the National Science Foundation in the enclosed self-addressed envelope.

Sincerely yours,

Charles E. Falk

Charles E. Falk
Planning Director

Enclosures

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NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

May 23, 1968

Dear Departmental Chairman:

In a letter dated May 3, we requested your assistance in a Survey of Faculty Research Activities, Spring 1968, but have not as yet received your reply.

The utilization of faculty and their opportunities for research are matters of wide interest. The opportunities for young investigators to perform meaningful research are particularly important. We believe that your answers and comments in the survey will provide very useful information to help those who are concerned with the development of policies related to national support of science activities.

The number of individuals queried in this survey is not large, so it is quite important that your answers be included along with others in your field. Your helpfulness in assisting us in this survey by completing the questionnaire promptly will be deeply appreciated.

If there are any questions concerning the information requested, please write to the Planning Director, National Science Foundation, 1800 G Street, N.W., Washington, D.C. 20550, or call the Science Education Studies Group:

Justin C. Lewis, Study Director	Area Code 202, 343-7822
Felix Lindsay, Associate Study Director	" 343-6516

In the event that the survey questionnaire failed to reach you or was misplaced, additional copies are enclosed. Please submit your response on the copy of the questionnaire labeled with your name, department, and institution. Replies should be mailed in the enclosed self-addressed envelope.

Please disregard this request if your response crossed it in the mails.

Sincerely yours,

Charles E. Falk
Planning Director

Enclosures

Budget Bureau No. 99-S68002
Approved Expires: 12/68

NATIONAL SCIENCE FOUNDATION
Washington, D. C. 20550

SURVEY OF FACULTY RESEARCH ACTIVITIES
SPRING 1968

Instructions

The following questions relate to research activities of regular full-time faculty assigned to your department. Include only persons who serve at a professional level in your department as teachers, researchers, or in other professional capacities. Please do not include the following as regular full-time faculty: visiting professors, post-doctoral fellows and research associates, graduate students, or others who are not regular full-time faculty of your department. Include yourself. If any full-time faculty serve at least half time in your department and part time in another department, provide information regarding these individuals as if they were assigned solely to your department.

Data are requested separately on full-time faculty according to length of time since the Ph.D. degree was earned. Faculty members who were awarded the Ph.D. degree after the year 1960 should be counted in the category "7 years or less" since Ph.D. For purposes of this study these faculty members are considered "young investigators."

The term principal investigator refers to the person so designated by an academic institution. In practice, principal investigators are identified as such on proposals and applications.

Federal research project funds as used in this questionnaire includes only Federal funds designated for specified research projects through grants or contracts. It does not include Federal funds for general support, such as the National Science Foundation Science Development Grants, even though portions of such funds may be used by the institution for research projects.

"Other than Federal research project funds" as used in question 5 should include all research funds (sponsored research and general institutional funds for research) excluding Federal research project funds. This same definition also applies to question 4.

The assumption made in questions 8 and 9 of "no change in total funds" for research is for the purpose of this study only. No implications as to the future amount of research funds are intended.

If additional space is needed for explanations or comment, please attach an additional sheet of paper.

Budget Bureau No. 99-S68002
Approval Expires: 12/68

NATIONAL SCIENCE FOUNDATION
Washington, D. C. 20550

SURVEY OF FACULTY RESEARCH ACTIVITIES
SPRING 1968

Institution (name and location)

Department

Name and title of person to contact about this survey

Address and telephone number of the person named above

1. How many regular full-time faculty members are there in your department at the present time? How many spend approximately 20 percent or more of their time in research activities? Please enter totals and numbers according to length of time since Ph.D. (e.g., include those whose Ph.D.'s were granted after 1960 under "7 years or less"). See Instructions re inclusions and exclusions.

	Total	Years since Ph.D.		No Ph.D.
		7 years or less	More than 7 years	
All faculty				
Faculty spending 20 percent or more of time on research				

2. How many regular full-time faculty members were there in your department in the spring of 1966? _____; in the spring of 1964? _____.

3. How many regular full-time faculty members in your department spend at least 20 percent of their time on research directly connected with project grants and contracts awarded by Federal agencies? How many of these are principal investigators? Enter totals and numbers according to length of time since Ph.D.

	Total	Years since Ph.D.		No Ph.D.
		7 years or less	More than 7 years	
Total				
Principal investigators only				

4. Excluding from consideration Federal research project funds, to what extent do you influence the decisions on the allocation within your department to faculty members of other research funds?

Generally make the major decisions _____ (1)
Exert a modest influence _____ (2)
Little or no influence _____ (3)

(a) If you do not make the major decisions, indicate those who do (by positions and organizational units):

_____

_____

5. Please estimate how much of all research funds available to staff of your department in the current fiscal year comes from other than Federal research project funds. Check applicable item below:

Less than 10% _____ (1) 30% - 49% _____ (3)
10% - 29% _____ (2) 50% or more _____ (4)

6. Considering all the research funds now available to faculty in your department, is there, in your opinion, an appropriate split between funds available to young (7 or less years from Ph.D.) and senior (more than 7 years from Ph.D.) staff? YES _____(1) NO _____(2)

If "NO," answer (a) and (b).

(a) Under current arrangements, an adequate amount of research is not being performed by: (check only one)

Young investigators _____ (1)
Senior investigators _____ (2)

(b) Please explain the causes for this situation:

_____

_____

_____

7. Under current arrangements, which of the following in your department are not able to engage in research on subjects of their own choosing to the extent they should? (check one)

Young investigators only _____ (1)
Senior investigators only _____ (2)
Young and senior investigators _____ (3)
No problem in this area _____ (4)

8. Assuming no change in total funds from all sources available to your staff for research, should a greater proportion of funds go to (check one)

Young investigators? _____ (1)
Senior investigators? _____ (2)
No change recommended _____ (3)

9. If your answer to 6 is "NO," what changes, if any, in programs which support the kind of research that is carried on in your department would you recommend, assuming that the amount of research funds available to you and your staff from various sources will not increase?

	YES	NO
(a) Allocate a greater proportion of currently available Federal funds to research project grants or contracts	_____(1)	_____(2)
(b) Allocate a greater proportion of currently available Federal funds to institutional, departmental, or block grants	_____(1)	_____(2)
(c) Provide specific Federal support programs for staff in the "young" group	_____(1)	_____(2)

(1) Do you think it important that some of the support through these programs be earmarked for special equipment for the "young" group? YES ☐(1) NO ☐(2)

(d) Provide specific Federal support programs for staff in the "senior" group	_____(1)	_____(2)
(e) Make no changes in Federal research support programs	_____(1)	

(f) Other suggestions (specify)

_____

_____

_____

10. Please provide any additional comments you wish to make on problems hindering the conduct of research in your field by young faculty and suggestions for their alleviation:

_____

_____

_____

INTRODUCTORY STATEMENT TO FOLLOW-UP QUESTION

Your response to the Spring 1968 National Science Foundation Survey of Faculty Research Activities was very helpful. We are, though, requesting clarification of the responses to one question. In question 7 we asked "Under current arrangements, which of the following in your department <u>are not able to engage</u> in research on subjects of their choosing to the extent they should?" We feel that the question may not have been uniformly interpreted by all respondents. We'd like to be able to distinguish whether you feel that the existing problem is one of staff not being able to engage in research <u>generally</u> as much as they should or whether they are not able to engage in research on subjects <u>of their own choosing</u> as much as they should.

TELEPHONE FOLLOW UP TO CLARIFY QUESTION NO. 7 IN SURVEY OF FACULTY RESEARCH ACTIVITIES, SEPT. 1968

Institution

Department

Name of individual contacted Telephone number

Would you please answer the following questions on the basis of your opinion at this time, without respect to your previous answers:

a. Please indicate your opinion first as to whether staff are able to do as much research as they should.

EXTENT OF RESEARCH	"Young" staff		"Senior" staff	
Is there a problem in this respect for	YES☐	NO☐	YES☐	NO☐
If yes for either:				
Is this a minor problem or a major problem for the "YS"; for "SS" (if applicable)	MIN☐	MAJ☐	MIN☐	MAJ☐

b. Now please tell us whether staff are able to select research areas of their own choosing to the extent they should.

RESEARCH ON SUBJECTS OF OWN CHOOSING	"Young" staff		"Senior" staff	
Is there a problem in this respect for	YES☐	NO☐	YES☐	NO☐
If yes for either:				
Is this a minor problem or a major problem for the "YS"; for "SS" (if applicable)	MIN☐	MAJ☐	MIN☐	MAJ☐

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